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ABSTRACT

A study examined the employment qualifications, job content, training, and training needs of ambulance service and rescue squad workers in Nebraska. Based on the 268 mail questionnaires that were completed and returned out of a total of 338 sent out, it was concluded that the strengths of the various ambulance and rescue services vary widely. The majority of the services had 75 percent or more of their driver and attendant personnel certified, but only about 41 percent had all certified personnel. Reports of the average amount of training and handling of chemical trauma and pesticide poisoning cases ranged from none to three or four hours. The certification training program available for these workers covers poisonings of all types in approximately three hours. More than one-third of all respondents reported no inservice training on chemical trauma and pesticide poisonings in the past three years. A substantial majority of the respondents did say that their personnel would be likely to participate in such an inservice training program if it were available. Based on these findings, recommendations were made calling for the Nebraska State Department of Health to work together with the University of Nebraska Medical Center and the Cooperative Extension Service to develop an inservice program for rescue squad workers dealing with chemical trauma and pesticide poisoning emergencies. (MN)

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ENVIRONMENTAL PROGRAMS

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ASSESSING PESTICIDE IMPACT ON HUMAN HEALTH IN NEBRASKA:

A Survey of Ambulance Services and Rescue Squads

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Cooperative Extension Service
Institute of Agriculture & Natural Resources
University of Nebraska-Lincoln
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ASSESSING PESTICIDE IMPACT ON HUMAN HEALTH IN NEBRASKA:

A SURVEY OF AMBULANCE SERVICES & RESCUE SQUADS

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SUMMARY

A mail survey of 338 ambulance services/rescue squads in Nebraska was conducted in spring 1983. Two mailings resulted in 268 responses, a return rate of 79.2%. Eleven responses were received too late to be included in the tabulation and analysis.

Results of the survey indicated that nearly 75% of the responding services were based in communities of 2,500 population or less. Most answer emergency calls within a radius of 11-20 miles of their base community; however, more than one-third respond to distances well over 20 miles.

A majority of the services are operated by a fire department or district. Approximately 44% of the respondents operate with only one emergency vehicle; however, a nearly equal number operate two-vehicle services. Most of the multiple vehicle services are based at one location in the community.

More than 70% of the respondents said the 911 emergency telephone number is not available in their community.

Based on total numbers of EMT-A certified personnel, the strengths of the various ambulance/rescue services vary widely. The majority of the services have 75% or more of their driver and attendant personnel certified, but only about 41% have all certified personnel.

Reports of the average amount of precertification training on handling chemical trauma/pesticide poisoning ranged from "none" to 3-4 hours. The certification training program covers poisonings of all types in approximately three hours.

More than one third of all respondents reported no in-service training on chemical trauma/pesticide poisonings during the past three years. Nearly half of all respondents had received only one to four hours of such training. Regional EMS Councils, community colleges, Cooperative Extension and an EMT professional association were tne leading sources of the training.

A substantial majority of the respondents said their personnel would be likely to participate in an in-service training program on chemical trauma/pesticide poisonings if it were available. Preferred program delivery methods, in order, were: regional EMS councils, independent study materials, and community colleges.

A total of 21 respondents reported having responded to a pesticide related emergency during calendar year 1982. Pesticides were the confirmed cause of the emergency in 15 cases, and most of the victims were 20 years of age or older.

INTRODUCTION

Using pesticides in agricultural production has long been an established practice. With an estimated 18.9 million acres in crop production,[1/] Nebraska is one of the nation's leading agricultural states and a major consumer of pesticides. It has been estimated that 30.7 million pounds of pesticide active ingredient (AI) were applied during the 1982 growing season in Nebraska for major field crops alone.[2/]

Storing, transporting, handling and applying the volume of pesticide used in Nebraska provides ample potential for accidents. According to an official of the Nebraska Poison Control Center at Omaha's Children's Memorial Hospital, approximately five percent of the more than 20,000 calls they have received during each of the past three years have been pesticide related.[3/] In addition, two surveys of Nebraska rural and urban homeowners produced evidence indicating that ill effects have been suffered by some pesticide users attempting to control pests in and around the home.[4/]

There is no organized pesticide accident reporting service in Nebraska, and the statistical records division of the State Department of Health does not require reports or maintain records of pesticide related accidents and incidents. However, there is clear evidence indicating that pesticide accidents have occurred, and given the quantities of pesticides presently being used, probably will continue to occur. Depending upon specific circumstances, health services resources (ambulance services/rescue squads, hospitals, physicians) and emergency support services (fire fighters, law enforcement officials) may be needed to respond to a pesticide related accident or incident.

A comprehensive, in-depth research study was launched in late 1981 with two fundamental objectives: 1) to assess the capacities of both health services and emergency support resources to cope with pesticide related emergencies; 2) to assess the need for new in-service educational resources on pesticide accident/incident protocols for both health services and emergency support personnel.

This report on ambulance services/rescue squads is one of a series reporting results of that study.

METHODS AND PROCEDURES

A statewide mail survey of licensed ambulance services was made during the spring of 1983. The survey collected general information about each ambulance service, information on both precertification and in-service training for attendants, and where applicable, data on responses to pesticide accidents during calendar year 1982. Data collected and analysis are discussed in the sections that follow.

Sample Design

A "Directory of Licensed Ambulance Services" for the state is published by the Division of Emergency Medical Services, Nebraska Department of Health. According to the latest available edition of that directory (1981), there are 338 licensed ambulance services/rescue squads in Nebraska. All services listed in the directory were included in the survey.

Questionnaire Development

Research questions that this survey focused on included:

1. What resources (i.e. number of vehicles, certified attendants) are available in a community of a given population to respond to emergencies within the service area?
2. How much precertification training do ambulance attendants receive on handling pesticide related emergencies and from what source?
3. How much in-service training do ambulance attendants receive on dealing with pesticide related emergencies and from what source?
4. Are the heads of ambulance/rescue services that have responded to pesticide related emergencies more likely than the heads of nonresponding services to perceive a need for in-service training on such emergencies?

Questionnaire items relating to these issues were drafted and subjected to both internal and external review.

The internal review consisted of analysis and critique by staff of the UN-L Institute of Agriculture and Natural Resources Office of Environmental Programs and by the Extension program evaluation specialist.

Staff members of the Division of Emergency Medical Services, Nebraska Department of Health and staff at the University of Nebraska Medical Center provided external analysis and critique.

Recommendations from both the internal and external reviews were incorporated into the final draft of the questionnaire items. The questionnaire (Appendix 1) was printed using a format designed to facilitate computer encoding of the data. In addition, each copy of the questionnaire had a three-digit number printed in the upper right hand corner of the first page. A specific reference was made to that number in the cover letter which accompanied the questionnaires indicating that its sole purpose was to facilitate followup mailings.

Data Collection

In early April 1983, the chief, captain or other ranking authority at each of the 338 ambulance services/rescue squads was mailed a copy of the questionnaire, an individually addressed cover letter (Appendix 2) and a post-paid return envelope. Completed questionnaires were returned by 206 respondents (60.9%).

A second mailing was made approximately six weeks after the first. A new copy of the questionnaire, a revised cover letter (Appendix 3), and post-paid envelope were sent to those addresses who had not responded to the first mailing.

The second mailing produced 62 additional responses over a period of approximately eight weeks. The 268 responses received represented 79.3% of the surveyed population. Data collection was terminated at this point and the completed questionnaires were sent to the NMR Biometrics and Information Systems Center for computer processing. Eleven additional completed questionnaires were subsequently received, but were not included in the tabulation and analysis.

FINDINGS

The distribution of ambulance services/rescue squads in Nebraska parallels the demographics of the state's communities. Nearly 74% are based in communities of 2,500 or less and fractionally more than 85% are located in towns under 5,000 population (Table 1).

The majority of Nebraska ambulance/rescue services respond to relatively large service areas. The median distance for all respondents was 11-20 miles; however, 95 respondents (approximately 35%) reported serving areas in which driving distance to the farthest point was 21 miles or more. There were 34 respondents who said they answered emergency calls to points over 30 miles distant; of those, eight said the distance was 50 miles or more (Table 2).

The services were operated under a variety of managerial models. The most common was operation as part of the local fire department or district. Fractionally less than 70% of the services fell into this category. Approximately 20% were reported as "other"; these included services operated by municipal government, county boards, and volunteer organizations (Table 3).

Most Nebraska communities are served by ambulance/rescue services having one or, at most, two emergency units. Of the 268 survey respondents, 118 (44%) were one-unit services (Table 4). A nearly equal number of communities (115) were served by two-ambulance services.

Administrators of ambulance services operating more than one ambulance were asked to indicate how many had units located at more than one site in the community. Of the 169 respondents who answered that question, only 16 responded affirmatively.

The common emergency telephone number 911 has been available in some Nebraska localities since the early 1970's. While the service has been available for well over a decade, the majority of the respondents in this study reported that the number was not used in their community. Less than 30% of the communities represented in this survey were using the 911 emergency number (Table 5). However, because the majority of Nebraska's population is concentrated in the eastern part of the state, it is estimated that approximately 65% of the state's population has access to 911 services.[5/]

The total number of certified attendants[6/] associated with each ambulance/rescue service, in general, was approximately equal. There were 74 respondents reporting 11-15 certified attendants, 71 reporting 16-20, 67 reporting 20 or over, and 54 having 10 or fewer (Table 6A). Those reporting "Over 20" were asked to specify the number; 44 of the 67 reported specific numbers. Increasing the increment size from 5 to 10 and incorporating that data produces the range shown in Table 6B. From this modified table it is apparent that the majority of services have 11-20 certified attendants and approximately 20% of the services have 10 or fewer.

Of 267 respondents answering a related question on the percentage of driver/attendant personnel holding EMT-A certification, 110 (41%) reported all personnel being so certified. An additional 84 respondents (31%) reported 75-99% of their personnel being certified (Table 7). Cumulatively, less than 13% of the respondents said less than half of their personnel had qualified for certification.

As noted elsewhere in this paper, the EMT training course is a fixed program (i.e. a specified period of time is devoted to a given topic).

However, respondents reported various average amounts of time in precertification training on chemical trauma/pesticide poisoning (Table 8). Of the 262 respondents who answered this question, 44 said 3-4 hours was spent on the topic, while another 68 said they received less than one hour. Most respondents (96) reported that 1-2 hours was devoted to the topic. The 80-hour course, as taught by the Emergency Medical Services Division of the Nebraska State Department of Health includes approximately three hours on poisonings of all types, including alcohol and drug poisoning. Signs and symptoms associated with inhalation, ingestion, and absorption are discussed in general terms along with procedures to be followed in each instance.[7/] In addition, it was found that EMT course instructors have expressed concern that additional class time is needed in the course to adequately cover chemical poisoning.[8/]

In general, respondents report relatively little in-service training time having been devoted to chemical trauma/pesticide training during the past three years. Of 251 responses to an item on that issue, 127 (47%) reported that only 1-4 hours of training had been presented in that time. More than a third of the respondents answering the item reported that no training on the topic had been presented in that time (Table 9).

The in-service training that was presented was delivered by a wide variety of sources. Regional EMS councils, cited by 44 respondents, was the source most frequently used. Community colleges presented training for 31 respondents while the Cooperative Extension Service and an EMT professional association each presented training for 29 respondents (Table 10). Approximately one of every five respondents reported "other" sources of training; those most frequently mentioned included: local or departmental training (15), the Nebraska Fire Service (11), and aerial applicators (6).

One survey item specifically addressed the question of participation in in-service training on chemical trauma/pesticide poisoning if it were available. Only 174 respondents completed that item. However, of that number, 96% claimed their people would be likely to participate (Table 11).

The most preferred methods for delivering future in-service training programs were through the Regional EMS Councils and independent study materials (i.e. workbooks, correspondence course materials, slide-tape programs, videocasettes, etc.); 80 and 78 respondents respectively cited those options. Training provided through a community college was identified as a preference of 55 respondents, and 42 listed EMT professional association meetings as being an acceptable method (Table 12).

As indicated in Table 13, 21 ambulance services/rescue squads responded during calendar year 1982 to chemical trauma/pesticide poisoning cases. In 15 of those responses, pesticide poisoning was the confirmed cause of the emergency; in two cases, it was suspected but not confirmed. Fourteen of the victims were 20 years of age or over, two were in the 6-12 year age bracket and one was five years of age or under.

Most of the responses were to rural (farm or ranch) sites; only four were to urban or suburban sites.

Products to which the poisoning victims were exposed included: anhydrous ammonia, 2,4-D, Thimet 10-G, parathion, diazinon, chloropicrin, and household cleansers.

None of the pesticide accident victims were reported to have expired either at the accident scene or enroute to the hospital. However, in 12

cases decontamination of the victim's skin was required, respiratory support was needed in 10 cases, and in one instance cardiopulmonary resuscitation (CPR) was administered.

ANALYSIS

Additional analysis of responses to selected items provides useful perspective on some of the salient questions in this study.

Ambulance services in the smallest communities tended to be the ones having the largest service areas. Fractionally more than 40% (108 services) responded to calls within a 10-20 mile radius. Of those, 83 were based in communities having 2,500 population or fewer. Larger response areas were served by many of the survey respondents. Approximately 23% served areas ranging from 21-30 miles; nearly 13% served areas in which the farthest point exceeded 30 miles. Again, the majority of the services operating in those large geograpical response areas were based in communities under 2,500 population (Table 14).

Responses to the items on population of the principal community served and management of the ambulance/rescue service were compared with the items on numbers and percentages of EMT-A certified attendants. Predictably, most of Nebraska's larger communities (15,000 or more in population) tended to have large numbers of certified attendants (20 or more) associated with their ambulance services. However, many smaller communities also have services with large numbers of certified attendants. More than half of the communities with 5,001 to 15,000 population have services with 20 or more certified attendants. In addition, there were

10 communities with 2,501-5,000 population and 32 communities under 2,500 having similar size services (Table 15A).

Examining the rosters of ambulance/rescue service personnel in the small towns which have unexpectedly large numbers of personnel associated with them indicates that there may be social as well as community service aspects for the persons involved. Common surnames on these rosters indicate that father-son, husband-wife, and brother combinations have associated themselves with the services.

Analysis by management type indicates only that there is considerable diversity in the size of the ambulance/rescue operations. For example, the number of private/commercial services having 10 or fewer certified attendants and 20 or more certified attendants is equal. Similarly, there is some tendency in the services operated by fire departments to have larger numbers of certified personnel (i.e. 11-15 or more). The number of certified attendants in "Other" (volunteer, city-owned or county-owned) services is nearly equally distributed (Table 15B).

In general, it can be concluded that there is some degree of pressure to have all ambulance/rescue personnel EMT-A certified. There were 109 respondents from communities of all population range categories who said all of their personnel were certified (Table 16A); another 84 reported that 75% or more, but less than 100%, were so certified.

Pairing the responses for percentage of personnel certified with management type (Table 16B), it becomes clear that the majority of ambulance/rescue services with less than 75% of their personnel certified are those associated with fire departments in the state's smallest communities.

A substantial majority of all responding ambulance services, regardless of community size, report either 1-4 hours or no in-service training on chemical trauma/pesticide poisoning during the past three years. Cumulatively, 95 services (35% of all responding services) reported that no such training had been presented. Nearly half of the services (47%) reported that only one to four hours of training had been presented. Only 29 (approximately 11%) of the responding services claimed that their personnel had received five or more hours of such training during the past three years (Table 17A). Most of the ambulance/rescue services which had spent five or more in-service training hours on pesticide poisonings were based in communities of 5,000 or less population.

Arraying reported in-service training hours by ambulance/rescue service management type reveals that only 19 fire department-related services had five or more hours training on pesticide emergencies; this represents approximately 11% of all fire department related services and seven percent of all respondents to the survey. Seven volunteer, city-owned or county-owned services (approximately 13% of the "other" category and three percent of all respondents) reported five or more hours of pesticide related in-service training (Table 17B).

Although in-service training on chemical trauma/pesticide poisoning apparently is not discussed intensively during most in-service training, there does appear to be a perceived need by many for it (Tables 11, 18). In an item that asked whether their personnel would be likely to participate if such training were available, 167 respondents replied affirmatively and only seven negatively. However, there were 94 respondents (35%)

who gave no reply to that item; 88 of the nonrespondents were from communities of 5,000 or fewer population (Table 18A). As indicated by Table 18B, the majority of nonrespondents were services associated with fire departments. Approximately one fourth of the all-volunteer, city-owned, and county-owned services and nearly half of the private/commercial services indicated no response to the item on likelihood of participation if training opportunities were available.

It should be noted also that of the 94 services that did not respond to the item on likely participation in pesticide related in-service training, 77 reported no in-service training during the previous three years. There were 14 respondents who did not respond to either item (Table 19).

Of the 21 services that reported responding to pesticide related emergencies during calendar year 1982, 16 reported that their personnel would be likely to participate in in-service training on such emergencies if it were available. The remaining five did not respond to the item (Table 20).

While perceived need can largely be eliminated as a reason for nonpresentation by most respondents, other potential reasons remain. These include, in part, lack of time, lack of educational resources, and lack of access to expert instructors. Those services which did provide in-service training on pesticide poisonings drew upon a variety of resources (Table 10). It must be concluded, therefore, that lack of time or some equally compelling reason has created this gap in ambulance service/rescue squad in-service training programs.

RECOMMENDATIONS

Results of this study clearly indicate that during the past three years personnel of most Nebraska ambulance services and rescue squads have received minimal or no in-service training on handling chemical trauma/pesticide poisoning emergencies. In addition, a majority of respondents said their personnel would be likely participants in such training if it were available. The results also show that some Nebraska ambulance services have had to respond to pesticide emergencies within the past year.

Recognizing that substantial quantities of pesticides are used in major agricultural states such as Nebraska, and that with intensive use there is inevitably risk of accidents, the following is recommended:

1. Development of in-service training resources (lesson plans, study materials, audiovisuals, etc.) that would encompass as a minimum identification of the various categories of pesticides (i.e. organophosphates, carbamates, organochlorines, etc.), the general toxicology of each, recognition of the signs and symptoms of each type of poisoning, and emergency treatment required for each.
2. Development of training resources to support extended training experiences focusing on the use of individual protective clothing and equipment which may be needed while providing aid to victims in hazardous environment situations.
3. That the Cooperative Extension Service, University of Nebraska Medical Center and Emergency Medical Services Division of the Nebraska State Department of Health jointly plan and develop the

resources described above for use by all appropriate training agencies.

4. That potential sources of existing training resources be contacted before the development of new materials is begun in order to take advantage of any appropriate resources that may already be available.

FOOTNOTES

1/ Personal communication of the author with Bill Dobbs, Assistant State Statistician, Nebraska Crop and Livestock Reporting Service. Data cited is for the 1982 growing season.

2/ Personal communication of the author with Michael Hanthorn, Agricultural Economist, Economic Research Service, U.S. Department of Agriculture. Estimate given is preliminary data from the 1982 Crop and Livestock Pesticide Usage Survey.

3/ Personal communication of the author with Laura Lee Brennan, RN, Coordinator of the Nebraska Poison Control Center at Children's Memorial Hospital, Omaha.

4/ See Kamble, et al. "Nebraska Residential Pesticide Use Survey (1979 and 1980)"; Department Report No. 3, Office of Environmental Programs, Cooperative Extension Service, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, April 1982.

5/ Estimate given by Paul Haith, Emergency Medical Services Division, Nebraska State Department of Health.

6/ "Certified attendants" are those who have successfully completed the Emergency Medical Technician-Ambulance course offered through the Emergency Medical Services Division of the Nebraska Department of Health. The Emergency Medical Technician (EMT) training program was created in the late 1960's by the U.S. Department of Transportation under provisions of the National Highway Safety Act of 1966. Ambulance service/rescue squad personnel who successfully complete an 81-hour training course - including written and practical examinations - are certified as Emergency Medical Technicians-Ambulance (EMT-A). Intermediate and paramedic levels of EMT training are also taught.

7/ Personal communication of the author with Paul Haith, Emergency Medical Services Division, Nebraska State Department of Health.

8/ Personal communication of the author with Paul Haith, Emergency Medical Services Division, Nebraska State Department of Health.

Table 1

Distribution of
Ambulance Services/Rescue Squads
by Population

POPULATION	NUMBER	%
2,500 or Less	198	73.9
2,501 - 5,000	31	11.6
5,001 - 15,000	19	7.1
15,001 - 50,000	13	4.9
50,001 or greater	6	2.2
No Response	1	0.4
TOTAL	268	100.1*

Table 2

Driving Distance to
Farthest Point in Service Area

MILES	NUMBER	%
Less than 5 miles	9	3.4
5 - 10 miles	50	18.7
11 - 20 miles	108	40.3
21 - 30 miles	61	22.8
Over 30 miles	34	12.7
NR	6	2.2
TOTAL	268	100.1%*

* Total exceeds 100% due to rounding error.

Table 3

Ambulance Services/Rescue Squads
by Type of Management

MANAGEMENT TYPE	NUMBER	%
Private commercial	15	5.6
Hospital operated	7	2.6
Fire department/district	187	69.8
Law enforcement agency	3	1.1
Other*	53	19.8
No Response	3	1.1
TOTAL	268	100.0

*Major categories included volunteer organizations (24), municipally owned (12), and county owned (10).

Table 4

Numbers of
Ambulance/Rescue Vehicles Operated

NUMBER OF VEHICLES	NUMBER OF RESPONDENTS	%
One	118	44.0
Two	116	43.3
Three	25	9.3
Four	3	1.1
Five or more	6	2.2
TOTAL	268	99.9

Multiple-unit operations with vehicles
at more than one site

Yes	16	9.5
No	153	95.5

Table 5

911 Emergency Number Available

	NUMBER	%
Yes	75	28.0
No	192	71.6
No Response	1	0.4

Table 6

Certified Attendants Associated With
Nebraska Ambulance Services/Rescue Squads

A

ATTENDANTS	NUMBER	%
10 or less	54	20.1
11 - 15	74	27.6
16 - 20	71	26.5
Over 20	67	25.0
No Response	2	0.7

B

ATTENDANTS	NUMBER	%
10 or less	54	20.1
11 - 20	145	54.1
21 - 30	27	10.1
31 - 40	11	4.1
41 or more	6	2.2
Not Specified/ No Response	25	9.3

Table 7

Percentages of Personnel Certified

% CERTIFIED	NUMBER	%
100	110	41.0
75 - 99	84	31.3
50 - 74	40	14.9
25 - 49	20	7.5
25 or less	13	4.9
No Response	1	.4
TOTAL	268	100.0

Table 8

Hours of Precertification Training
on Chemical Trauma/Pesticide Poisoning

HOURS	NUMBER	%
3 - 4	44	16.4
2 - 3	54	20.1
1 - 2	96	35.8
Less than one	68	25.4
No Response	6	2.2
TOTAL	268	99.9

Table 9

In-Service Training Time Devoted in Past Three Years to Chemical Trauma/Pesticide Poisoning

HOURS	NUMBER	%
16 or more	2	0.7
8 - 15	12	4.4
5 - 8	15	5.6
1 - 4	127	47.4
None	95	35.4
No Response	17	6.3
TOTAL	268	99.9

Table 10

In-Service Training Sources

SOURCE	NUMBER	%
Regional EMS Council	44	16.4
Community College	31	11.6
Cooperative Extension Service	29	10.8
EMT Professional Assn.	29	10.8
Univ. of Nebr. Medical Center	6	2.2
Other*	51	19.0

*Included (in part) local/departmental training (15), Nebraska Fire Service (11), and aerial pesticide applicators (6).

Table 11

Probability of Participation in In-Service Training
on Chemical Trauma/Pesticide Poisoning

RESPONSE	NUMBER	%
Yes	167	62.3
No	7	2.6
No Response	94	35.1

Table 12

Preferred Delivery Source/Method for Future In-Service Training
on Chemical Trauma/Pesticide Poisoning

SOURCE/METHOD	NUMBER*
Regional EMS Council	80
Independent Study Materials	78
Community College	55
EMT Professional Association	42
Teleconference/CCTV	15
Other	26

*More than one option selected by some respondents.

Table 13

Responses to Chemical Trauma/Pesticide Poisonings - 1982

YES	21
NO	240
NR	7

Pesticide Confirmed Cause	15
Pesticide Suspected Cause	2

VICTIM AGES

Under 5	1
6 - 12	2
13 - 19	-
20 or Over	14

RESPONSE DESTINATIONS

Rural	15
Urban/Suburban	4

VICTIM(S) EXPIRED AT SCENE
OR ENROUTE TO HOSPITAL

Yes	None
No	20
NR	248

PROCEDURES ENROUTE

Skin Decontamination	12
Respiratory Support	10
Cardiopulminary Resucitation	1
Other	4

Table 14

Ambulance Services/Rescue Squads
Expressed in Terms of Response Areas
and Base Community Population

	DISTANCE (MILES)					
	5 or less	5-10	10-20	20-30	over 30	NR
POPULATION						
2,500 or less	3	43	83	47	18	4
2,501- 5,000	2	3	16	5	5	0
5,001-15,000	2	1	6	4	5	1
15,001-50,000	0	3	2	4	3	1
50,000 or over	2	0	0	1	3	0
No Response	0	0	1	0	0	

Table 15

Ambulance Services/Rescue Squads
Expressed in Terms
of EMT-A Certified Attendants
and Base Community Population; Management

A

	CERTIFIED ATTENDANTS				
	10 or fewer	11-15	16-20	20 or more	NR
POPULATION					
2,500 or fewer	71	62	59	32	1
2,501- 5,000	6	6	9	10	0
5,001-15,000	3	4	2	10	0
15,001 or over	0	0	1	5	0
No Response	1	0	0	0	

B

MANAGEMENT					
Private/Commercial	6	2	1	6	0
Hospital	2	2	1	2	0
Fire Department	32	55	53	45	2
Law Enforcement	2	0	1	0	0
Other	12	14	14	13	0
No Response	0	1	0	0	

Table 16

Percentages of Personnel Certified
Arranged by Community Population and Service Management

A

POPULATION	PERCENTAGE CERTIFIED 100%	99-75	74-50	49-25	24-0	NR
2,500 or less	74	63	33	15	13	0
2,501 - 5,000	14	10	4	3	0	0
5,001 - 15,000	9	6	3	1	0	0
15,001 - 50,000	6	5	0	1	0	1
50,001 and over	6	0	0	0	0	0
No Response	1	0	0	0	0	

B

MANAGEMENT	100%	99-75	74-50	49-25	24-0	NR
Private/Commercial	7	5	1	0	2	0
Hospital	5	1	1	0	0	0
Fire Department	62	61	33	19	11	1
Law Enforcement	[illegible]	0	1	1	0	0
Other	[illegible]	16	4	0	0	0
No Response	[illegible]	1	0	0	0	

Table 17

Hours of In-Service Training
on Chemical Trauma/Pesticide Poisoning
For Three-Year Period by Population
of Base Community and by Management Type

A

POPULATION	HOURS					
	16 or more	15-8	7-5	4-1	None	NR
2,500 or fewer	0	6	8	91	81	12
2,501- 5,000	2	3	3	11	10	2
5,001-15,000	0	1	1	13	2	2
15,001-50,000	0	1	3	7	1	1
50,000 or more	0	1	0	4	1	0
No Response	0	0	0	1	0	

B

MANAGEMENT						
Private/Commercial	0	1	0	7	7	0
Hospital	0	2	0	4	1	0
Fire Department	2	6	11	86	68	14
Law Enforcement	0	0	0	2	1	0
Other	0	3	4	25	18	3
No Response	0	0	0	3	0	

Table 18

Population of Base Community and Management Type
By Likelihood of Participation In New In-Service Programs

A

POPULATION	PARTICIPATION LIKELIHOOD		
	Yes	No	No Response
2,500 or less	115	3	80
2,501- 5,000	22	1	8
5,001-15,000	15	1	3
15,001-50,000	10	1	2
50,001 or more	4	1	1
No Response	1	0	0
TOTALS	167	7	94

B

MANAGEMENT			
Private/Commercial	7	1	7
Hospital	5	1	1
Fire Department	112	4	71
Law Enforcement	2	0	1
Other	38	1	14
No Response	3	0	0
TOTALS	167	7	94

Table 19

Reported Hours of In-Service Training
By Likelihood of Participation
In New In-Service Programs

HOURS	PARTICIPATION LIKELIHOOD		
	Yes	No	No Response
16 or more	2	0	0
15-8	11	0	1
7-5	15	0	0
4-1	118	7	2
None	18	0	77
No Response	3	0	14

Table 20

Reported Likelihood of In-Service Participation
by Response to Pesticide Emergency

PARTICIPATION LIKELIHOOD	RESPONSE		
	Yes	No	No Response
Yes	16	146	5
No	0	7	0
No Response	5	87	2

APPENDIX 1

UNIVERSITY OF NEBRASKA N° 195

University of Nebraska
Medical Center

Institute of Agriculture
and Natural Resources

**Assessing Pesticide Impact
on Human Health in Nebraska
Ambulance/Rescue Survey**

Please place a check mark in the appropriate space or write your answer in the space provided for each of the following questions.

1. **What is the population of the community in which your service is based?**

_____ 1. 2,500 or less
_____ 2. 2,501 - 5,000
_____ 3. 5,001 - 15,000
_____ 4. 15,001 - 50,000
_____ 5. 50,001 or greater

2. **From the location at which your ambulance/rescue service is based, what is the driving distance to the farthest point in the area you service?**

_____ 1. Less than 5 miles
_____ 2. 5 - 10 miles
_____ 3. 11 - 20 miles
_____ 4. 21 - 30 miles
_____ 5. Over 30 miles (please specify): _____

3. **Under what type of management is your ambulance/rescue service operated?**

_____ 1. Private, commercial service
_____ 2. Operated by a hospital
_____ 3. Operated by a fire department/district
_____ 4. Operated by a law enforcement department
_____ 5. Other (please specify) _____

4. **What is the total number of ambulance/rescue vehicles in your operating unit?**

_____ 1. One
_____ 2. Two
_____ 3. Three
_____ 4. Four
_____ 5. Five or more

(QUESTION ONLY FOR MULTIPLE UNIT OPERATIONS)

5. **Are ambulance/rescue units located at more than one site in the community?**

_____ 1. Yes
_____ 2. No

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(Appendix 1 contd.)

6. **Is the 911 common emergency telephone number used in your community?**

_____ 1. Yes
_____ 2. No

7. **What is the total number of certified attendants associated with your ambulance/rescue service?**

_____ 1. 10 or less
_____ 2. 11 - 15
_____ 3. 16 - 20
_____ 4. Over 20 (please specify) _____

8. **What percentage of your driver/attendant personnel hold EMT-A certification?**

_____ 1. 100%
_____ 2. 75% - 99%
_____ 3. 50% - 74%
_____ 4. 25% - 49%
_____ 5. Less than 25%

9. **What is the *average* amount of pre-certification training your ambulance attendants received on handling chemical trauma/particide poisoning cases (i.e. any illness caused by toxic chemicals being inhaled, ingested or absorbed through the skin)?**

_____ 1. 3-4 hours
_____ 2. 2-3 hours
_____ 3. 1-2 hours
_____ 4. Less than one (1) hour

10. **Within the past *three years*, how many hours of inservice training have your personnel received on chemical trauma/pesticide poisoning?**

_____ 1. 16 or more hours (please specify total) _____
_____ 2. 8 - 15 hours
_____ 3. 5 - 8 hours
_____ 4. 1 - 4 hours
_____ 5. NONE (Skip to question 13.)

11. **Through what sources was the in-service training presented?**

_____ 1. Cooperative Extension Service
_____ 2. Regional EMS Council
_____ 3. University of Nebraska Medical Center
_____ 4. Community College
_____ 5. EMT professional association
_____ 6. Other (please specify) _____

12. **If an in-service training program on chemical trauma/pesticide poisoning were available, would your personnel be likely to participate?**

_____ 1. Yes
_____ 2. No

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(Appendix 1 contd.)

13. What in-service program delivery method would you prefer for participating in training on chemical trauma/pesticide poisoning?

_____ 1. Regional EMS Council
_____ 2. Teleconference or closed circuit TV from University of Nebraska Medical Center
_____ 3. Community College program
_____ 4. EMT professional association meeting
_____ 5. Independent study materials (workbook, slide tape program, or videocasette)
_____ 6. Other (please specify) _____

14. During calendar year 1982, did your ambulance/rescue unit respond to any chemical trauma/pesticide poisoning incident(s)?

_____ 1. Yes (please complete parts "a" through "f")
_____ 2. No (skip to item #16)

a. Please put a number in the space provided indicating in how many responses pesticide poisoning was

_____ 1. The confirmed cause of the emergency?
_____ 2. Suspected, but not confirmed cause of the emergency

b. How many of the victims were in each of the following age categories:

_____ 1. Under five years of age
_____ 2. 6 - 12
_____ 3. 13 - 19
_____ 4. 20 or over

c. If it was noted, what was the product name and formulation of the insecticide, herbicide, etc., being used by the poisoning victim(s)?
(E.G. "XYZ Soil Insecticide 10G")

_____ _____

_____ _____

d. How many responses to pesticide poisoning incidents were to:

_____ 1. Rural (farm / ranch) sites?
_____ 2. Urban or suburban sites?

e. In the pesticide poisoning incidents to which you responded, did any victim(s) expire at the accident site or enroute to the hospital?

_____ 1. Yes (please specify number) _____
_____ 2. No

(Appendix 1 contd.)

f. In transporting any pesticide poisoning victim(s), which of the following procedures - if any - were you directed/required to perform?

_____ 1. Decontamination of skin
_____ 2. Respiratory support
_____ 3. Cardiopulmonary resuscitation (CPR)
_____ 4. Other (please specify) _____

15. Thank you for participating in this research survey. Please indicate if you wish to receive a summary of the results of this study.

_____ **1. Yes**
_____ **2. No**

NOTE: All information furnished in this survey will be regarded as strictly confidential. Data will be published in summary form only. Individual responses and identities of survey respondents will not be divulged under any circumstances.

Please return questionnaires in the postpaid envelope provided or mail to: Pesticide Impact Survey, 101 Natural Resources Hall, University of Nebraska-Lincoln, Lincoln, Nebraska 68583-0818.

If you have questions about the survey or desire further information, please contact Dr. David Olson, University of Nebraska Medical Center, Omaha, (402) 559-7299; or Drs. Roger E. Gold and Edward F. Vitzthum, Institute of Agriculture and Natural Resources, 101 Natural Resources, University of Nebraska-Lincoln (402) 472-1446.

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APPENDIX 2

Cooperative Extension Service
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln

Environmental Programs
101 Natural Resources Hall
Lincoln, NE 68583-0818
402-472-1446

Our purpose in writing is to request your participation in a study assessing the impact of pesticide use on human health in Nebraska. This investigation is being conducted by researchers of both the Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, and the University of Nebraska Medical Center, under terms of a U.S. Department of Agriculture grant. We believe -- and hope that you will agree -- that this study may have several long-term implications for the health and safety of Nebraskans.

Previous studies show that approximately 30 million pounds of pesticide active ingredients are applied annually in Nebraska. Most is used for agriculture, but substantial quantities are also used in urban and suburban areas. We also know that some pesticide poisonings do occur. The present investigation seeks to derive a broad spectrum of data relating to the resources, both human and physical, that might be available in the event of a pesticide emergency. Another objective is to assess the needs for in-service training programs for the various categories of professionals who may become involved in responding to pesticide accident emergencies.

A 15-item questionnaire is enclosed along with a post-paid return envelope. Please complete and return the questionnaire by April 22. PLEASE NOTE: The questionnaire has a number printed in the upper right corner. This is solely to facilitate mailing list management in the event a second mailing is required. Under no circumstances will individual responses to any item in this questionnaire be released. Data collected in this study will be published in summary form only, and a copy of that summary will be furnished on request. If you wish to receive a copy, check the "Yes" response to item 15.

Thank you in advance for your assistance in this study.

Sincerely,

Roger E. Gold, Ph.D.
Co-investigator
Institute of Agriculture
and Natural Resources

David Olson, M.D.
Co-investigator
University of Nebraska
Medical Center

Edward F. Vitzthum, Ph.D.
Project Research Asso.
Institute of Agriculture
and Natural Resources

Enclosures (2)

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APPENDIX 3

Cooperative Extension Service
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln

Environmental Programs
101 Natural Resources Hall
Lincoln, NE 68583-0818
402 472-1446

This is to renew our recent request for your assistance in conducting a vitally important human health study. The cover letter in that initial mailing described briefly a joint University of Nebraska Institute of Agriculture and Natural Resources and University of Nebrska Medical Center research study investigating the impact of pesticide use on human health in Nebraska. The accuracy, and ultimately, the usefulness, of this study depends on you and your colleagues throughout the state. For this reason, we urge you to take a few moments to respond to the 15 items in the enclosed questionnaire. A post-paid envelope is enclosed for your convenience in returning the completed questionnaire. PLEASE NOTE: The number printed in the upper right corner of the first page is intended for mail list management and to provide a means of identifying individuals who wish to receive a copy of the summary of this study. Under no circumstances will individual responses to any item in this questionnaire be released. Data collected in this study will be published in summary form only. If you wish to receive a copy of that summary, please be sure to check the "Yes" response in item 15.

Thank you in advance for your assistance in the research.

Sincerely,

Roger E. Gold, Ph.D.
Co-investigator
Institute of Agriculture and Natural Resources

David Olson, M.D.
Co-investigator
University of Nebraska Medical Center

Edward F. Vitzthum, Ph.D.
Project Research Asso.
Institute of Agriculture and Natural Resources

enclosures (2)